

CLAIMS

1. A fuel-saving management system comprising, on a motor vehicle:

information detection means (11, 12, 13, 14, 15, 16, 17, 18, 19, 20) for detecting information (S, E, A, F) on a running state of the vehicle;

information-processing means (3) for processing the information detected by the information detection means, the information-processing means also generating a warning when the processed information (A, dA, B, E, F, S, dS, Ti, Tt) satisfies required warning conditions (A1, A2, dA2, B2, E1, S2, dS2, Ti3, Tt2); and

information storage means (4) for storing the processed information;

wherein, when a time (Ta1, Ta2, Tda, Tb, Tds, Te, Ts0, Ts2) during which the processed information is maintained to satisfy the required warning conditions or an elapsed time (Ti, Tt) of the processed information exceeds a previously set time (T11, T12, T21, T22, T23, T24, T25, T26, T31), the information-processing means stores the occurrence of the overtime event into the information storage means.

2. A fuel-saving management system comprising, on a

information detection means (11, 12, 13, 14, 15, 16, 17, 18, 19, 20) for detecting information (S, E, A, F) on a running state of the vehicle; and

information-processing means (3) for processing the information detected by the information detection means, the information-processing means also generating a warning when the processed information (A, dA, B, E, F, S, dS, Ti, Tt) satisfies required warning conditions (A1, A2, dA2, B2, E1, S2, dS2, Ti3, Tt2);

wherein the system further has, on the vehicle, a setter (21) adapted such that the required warning conditions can be modified.

3. A fuel-saving management system comprising, on a motor vehicle:

information detection means (11, 12, 13, 14, 15, 16, 17, 18, 19, 20) for detecting information (S, E, A, F) on a running state of the vehicle;

information-processing means (3) for processing the information detected by the information detection means, the information-processing means also generating a warning when the processed information (A, dA, B, E, F, S, dS, Ti, Tt) satisfies required warning conditions (A1, A2, dA2, B2, E1, S2, dS2, Ti3, Tt2); and

information storage means (4) for storing the

wherein:

the system further has, on the vehicle, a setter
(21);

when either a time (Ta1, Ta2, Tda, Tb, Tds, Te, Ts0, Ts2) during which the processed information is maintained to satisfy the required warning conditions, or an elapsed time (Ti, Tt) of the processed information exceeds a previously set time (T11, T12, T21, T22, T23, T24, T25, T26, T31), the information-processing means stores the occurrence of the overtime event into the information storage means; and

the setter is adapted such that the required warning conditions and/or the previously set time can be modified.

4. The fuel-saving management system according to any one of claims 1 to 3, wherein the information on the running state of the vehicle includes an accelerator angle (A).

5. The fuel-saving management system according to claim 4, wherein the processed information includes the accelerator angle (A) and/or an accelerator angle change (dA) which is a variation in the accelerator angle (A) per unit time.

6. The fuel-saving management system according to claim 5, wherein:

vehicle speed (S) automatically to a level not greater than a required speed; and

the information-processing means (3) generates a warning on the accelerator angle (A) when the speed limiter is inactive.

7. The fuel-saving management system according to any one of claims 1 to 6, wherein the processed information includes processed general-road information and processed highway/expressway information.

8. The fuel-saving management system according to claim 7, wherein the processed general-road information includes either a vehicle speed (S), an engine speed (E), an accelerator angle (A), or an elapsed idling time (Ti), or a combination of any two thereof.

9. The fuel-saving management system according to claim 8, wherein the information-processing means (3) detects a fuel flow rate (F) as information on the running state of the vehicle, and generates the warning on the engine speed (E) when the fuel flow rate exceeds a previously set value (Fo).

10. The fuel-saving management system according to claim 7, wherein the processed highway/expressway information includes either a vehicle speed (S), an accelerator angle change (dA), a vehicle speed change (dS),

auxiliary brake usage ratio (B), or a combination of any two thereof.

11. The fuel-saving management system according to claim 10, wherein the information-processing means (3) detects an accelerator angle (A) as information on the running state of the vehicle, and generates the warning on the vehicle speed (S) when the accelerator angle exceeds a previously set value (A₀).

12. The fuel-saving management system according to any one of claims 2 to 11, wherein:

the information-processing means (3) enables selection of whether the warning is to be generated; and

the setter (21) is adapted to enable the selection based on the information-processing means, the information-processing means disabling the warning to be generated when the selection is enabled using the setter.

13. A fuel-saving management system comprising, on a motor vehicle:

information detection means (11, 12, 13, 14, 15, 16, 17, 18, 19, 20) for detecting information (S, E, A, F) on a running state of the vehicle;

information-processing means (3) for processing the information; and

information storage means (4) for storing processed

information that the information-processing means has processed;

wherein the system further has, on the vehicle, a printer (6) with an ability to output information (44, 45, 46, 47, 48, 49, 63, 64, 65, 66, 74, 75, 76, 77, 78, 79, 80, 81) that relates to the processed information stored within the information storage means.

14. The fuel-saving management system according to claim 13, wherein:

when the processed information (A, dA, B, E, F, S, dS, Ti, Tt) satisfies required warning conditions (A1, A2, dA2, B2, E1, S2, dS2, Ti3, Tt2), the information-processing means (3) generates a warning, and when either a time (Ta, Tda, Tb, Tds, Te, Ts0, Ts2) during which the processed information is maintained to satisfy the required warning conditions, or an elapsed time (Ti, Tt) of the processed information exceeds a previously set time (T11, T12, T21, T22, T23, T24, T25, T31), the information-processing means stores the occurrence of the overtime event into the information storage means; and

the printer (6) has an ability to output information (63, 64, 65, 66, 74, 75, 76, 77) that relates to the occurrence of the warning and/or overtime event stored within the information storage means (4).

claim 14, wherein the information-processing means (3) calculates an occurrence count of the overtime event, calculates an overlimit event occurrence rate (Rs, Ra, Re, Ri) from the occurrence count of the overtime event, and when the overlimit event occurrence rate exceeds a previously set value (Rso, Rao, Reo, Rio), causes a warning mark to be displayed on the information (74 to 77) output from the printer (6) in connection with the processed information.

16. The fuel-saving management system according to claim 15, wherein the overlimit event occurrence rate (Rs, Ra, Re, Ri) relates to a traveling distance (78) of the vehicle.

17. The fuel-saving management system according to any one of claims 13 to 16, wherein:

the information-processing means (3) calculates a fuel consumption rate of the vehicle; and

the printer (6) has an ability to output the fuel consumption rate (80).

18. The fuel-saving management system according to any one of claims 13 to 17, further comprising:

a travel starting switch (8d) operated during start of a travel of the vehicle; and

a printing switch (8b) operated for output from the

wherein:

when the travel starting switch is operated, the information-processing means (3) erases information relating to the processed information (A, dA, B, E, F, S, dS, Ti, Tt, TL) stored within the information storage means(4), and restarts storage of the information relating to the processed information, into the information storage means; and

when the printing switch is operated, the information-processing means (3) erases the information relating to the processed information stored within the information storage means.

19. The fuel-saving management system according to any one of claims 14 to 18, further comprising:

a setter (21) mounted on the vehicle, the setter enabling the required warning conditions (A1, dA2, B2, E1, S2, dS2, Ti3, Tt2) and/or the previously set time (T11, T12, T21, T22, T23, T24, T25, T31) to have respective settings modified;

wherein the printer (6) has an ability to output the required warning conditions (44 to 47) and previously set time (48, 49) whose settings were modified using the setter.

20. A fuel-saving management system, comprising:

a vehicle-mounted analyzer (1) and/or vehicle

analyses on fuel efficiency of a vehicle having an auxiliary brake;

wherein:

the vehicle-mounted analyzer includes information detection means for detecting a fuel flow rate (F) and/or accelerator angle (A) of the vehicle and information on use of the auxiliary brake; and

the vehicle-mounted analyzer and/or the vehicle owner/user company's data analyzer includes:

information-processing means (3) for calculating, from the fuel flow rate and/or the accelerator angle and from detected information on the use of the auxiliary brake, a cumulative traveling distance (TL) through which the vehicle traveled in a zero accelerator angle state with the auxiliary brake not being used; and

information storage means (4) for storing the cumulative traveling distance that the information detection means has calculated.

21. The fuel-saving management system according to claim 20, wherein the zero accelerator angle state is established when a fuel flow rate (F) becomes less than a previously set value (Fo) and/or when the accelerator angle (A) becomes approximately zero.

22. The fuel-saving management system according to

the vehicle includes an auto-cruise system having an ability to adjust a vehicle speed (S) of the vehicle to a required vehicle speed automatically; and

the information-processing means (3) judges that during operation of the auto-cruise system, the vehicle is in the zero accelerator angle state when the fuel flow rate (F) is less than the previously set value (Fo).

23. The fuel-saving management system according to any one of claims 20 to 22, further comprising:

information detection means (11) for detecting a vehicle speed (S) of the vehicle;

wherein the information-processing means (3) calculates a cumulative traveling distance (TL) from the vehicle speed detected by the information detection means, and from an elapsed time of traveling in the zero accelerator angle state with the auxiliary brake not being used.

24. The fuel-saving management system according to any one of claims 20 to 23, further comprising a printer (6) in the vehicle-mounted analyzer (1), wherein the printer has an ability to output information (81) on the cumulative traveling distance (TL) stored within the information storage means (4).